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## IS THERE A RELATION BETWEEN THE AMOUNT OF SCHOOLING AND FINANCIAL SUCCESS IN LATER LIFE?

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1. *The problem.*—While unanimity is lacking among the statisticians who have made a study of elimination, or the number of children who drop out of school at various stages, they are all practically agreed that not more than 50 per cent. of all the children enrolled in the schools complete even the eight grades of the elementary school, while only one in ten goes through the high school.

This investigation was undertaken with a view to ascertaining what the actual effect of elimination has been upon a representative group of adults, taking their later financial success as the criterion by which to measure the effect.

2. *The method of investigation.*—Five hundred adults now engaged in productive activity, and representing practically all the activities of a typical community, were asked regarding the date of leaving school and their present income. The data were secured at Lake Geneva, Wis., a town of some 3,800 inhabitants, and situated in an agricultural and dairying region. The five hundred respondents constitute about 75 per cent. of the voting citizens. With few exceptions all the professional and business men of the town were canvassed. The 25 per cent. not canvassed were chiefly common laborers and artisans, which classes are nevertheless the most largely represented in the investigation. As to numbers in various grades of occupation the order would

be: carpenters, day laborers, teamsters, painters, merchants and shop-keepers, stonemasons, plumbers, butchers, clerks, barbers, etc., concluding with six to ten each of physicians, lawyers, and ministers. And in addition to those immediately in the town forty-four farmers living in the adjacent vicinity were canvassed as to the same facts.

With a view to securing as correct data as possible the object of the investigation was explained to each respondent and an

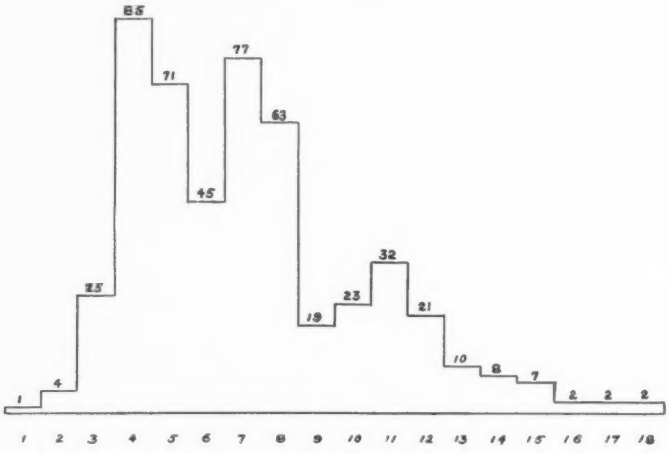


CHART I.—Distribution according to years of school attendance.

effort made to lead each one to feel that he had an opportunity of making a definite contribution to a study which might prove of some value to education in general. This seemed to be sufficient inducement to cause practically all of the respondents to make earnest endeavor to give correct data as to how many years each attended school. A check on the data as to compensation, or incomes, was made through the city treasurer, who is also assistant cashier of the principal bank of the town. Being a native of Lake Geneva, and having held both these positions for several years, he was able to render valuable assistance in checking up the data after it had all been secured.

3. *Explanation of charts.*—The next step was to find a

method of comparing these two sets of data, namely, those relating to school attendance and those relating to income, so as to ascertain how much correlation, if any, exists between them. This was done by means of the charts which follow. Arranging each set of data according to the "normal distribution curve" as represented in Charts I and II we are at once struck with a general resemblance between the two distribution curves, although they differ more or less in details. That is to say, taking up

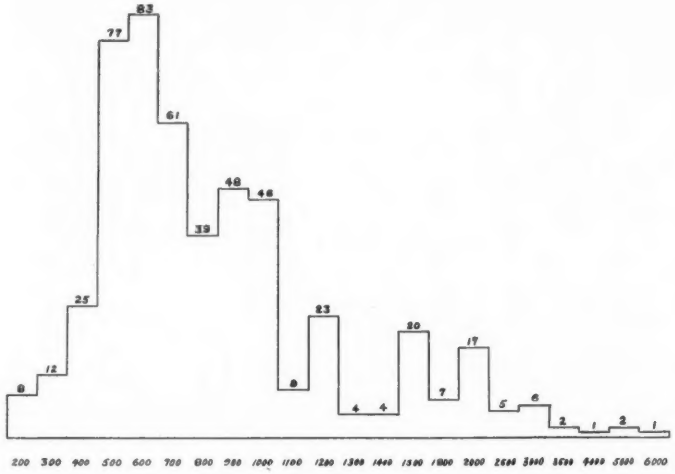


CHART II.—Distribution according to present salaries.

Chart I we observe that the entire range of years in school attendance is from one to eighteen; but 341, or 68 per cent. of the entire number, attended school from four to eight years, with comparatively few attending less than four or more than eight years. Making similar observation of Chart II we find that the salaries or incomes range from $200 to $6,000; but 354, or 71 per cent. of the entire five hundred, receive between $500 and $1,000, only twenty people receiving less than $400, and seventeen more than $2,000.

Passing from this more general comparison of the distributions, in which we see a gross similarity, let us take up Chart III,

in which by the use of cross-hatching and a more definite method of comparison we get an exact expression of correlation between the number of years these five hundred individuals attended school and their respective salaries or incomes.

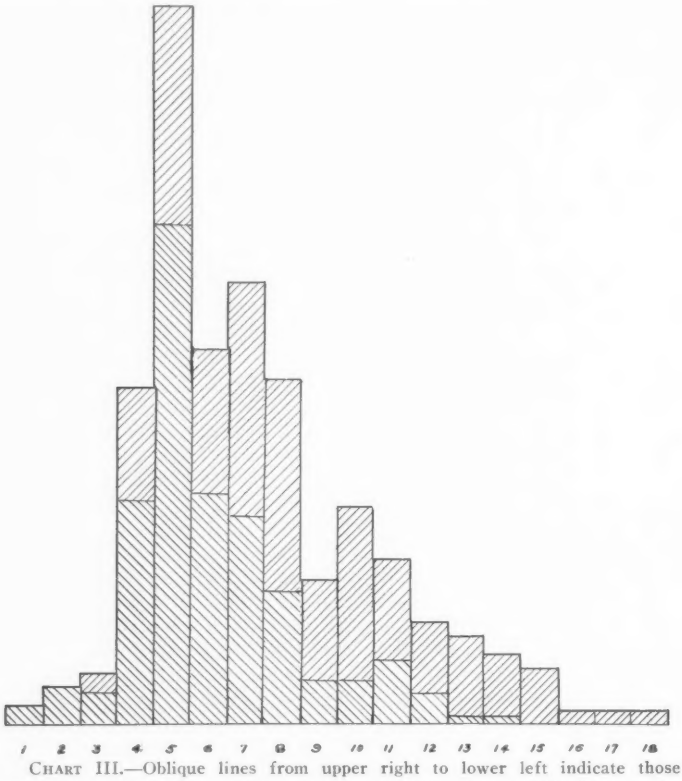


CHART III.—Oblique lines from upper right to lower left indicate those receiving more than $700; obliques from upper left to lower right those receiving $700 or less.

By actual count we find that half the entire number of individuals received over $700 as salaries or incomes; the other half of course receiving $700, or less. Therefore by using oblique lines from upper right to lower left to represent those who receive over $700, and oblique lines from upper left to lower right to

represent those receiving $700, or less, and by arranging the entire number of respondents in columns according to the number of years they attended school, it becomes evident at a glance that the majority of those receiving $700 or less, attended school less than eight years, whereas the majority of those receiving over $700 attended school more than six years.

In Chart IV we use a similar method, though here we have the obverse of Chart III. That is, we find by actual count that 243, or practically 50 per cent. of the entire five hundred people,

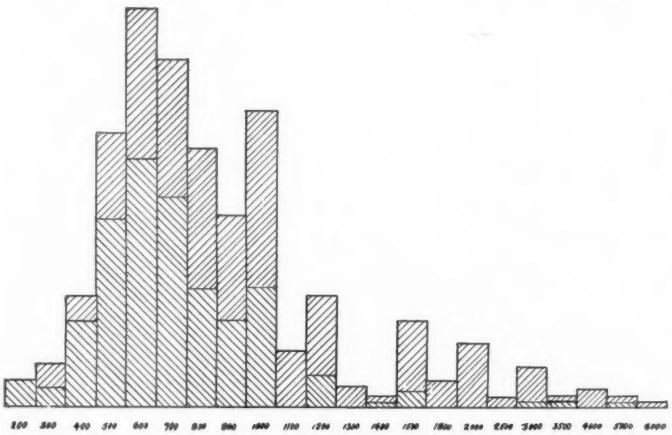

CHART IV.—Oblique lines from upper right to lower left indicate those in school more than six years; obliques from upper left to lower right, those in school six years or less.

attended school six years or less. Therefore in this chart we have arranged the entire number of cases in columns corresponding to their various salaries or incomes, representing those who attended school six years or less by oblique lines from upper left to lower right, and those attending school more than six years by obliques in the opposite direction.

The same general parallelism between the number of years in school and the size of the salaries or incomes appears as in Chart III, namely, the majority of those attending school six years or less receive the smaller salaries, while those attending

more than six years receive the larger salaries. For example, we find only thirteen people who attended school six years or less receiving over $1,000, while only twenty-eight people who attended school more than six years are receiving less than $600. Or to state the same thing in still other terms, if we use the result of this study as a criterion, any individual who has attended school more than six years has 68 chances to earn more than

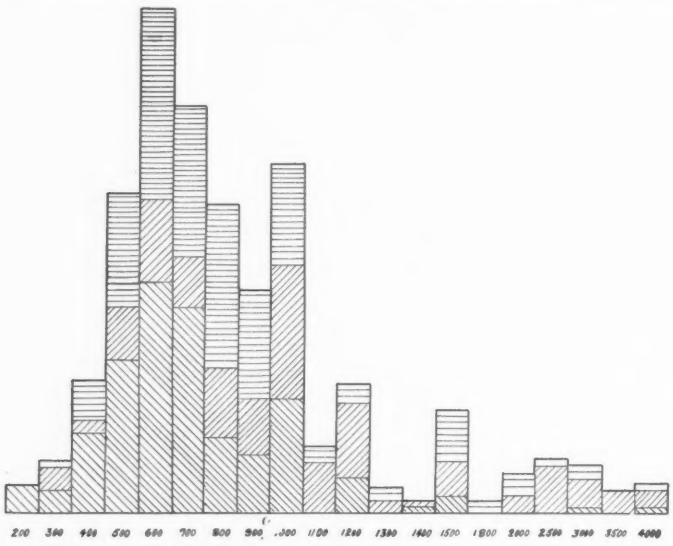


CHART V.—Obliques from upper left to lower right indicate those in school five years or less; obliques from upper right to lower left those in school nine years or more; horizontal lines, those in school from six to eight years.

$700, as against 32 chances that he will earn less than $700. Whereas, if he has attended school less than six years the chances are as 68 to 32 in favor of his earning less than $700 a year.

Chart V is an attempt to make still more apparent the correlation between these two sets of data. The whole number of respondents is divided into three approximately equal groups with reference to the number of years they attended school, although it turns out that there are 172 in each of the extreme groups, or thirds, and only 156 in the middle third. The first

third represents those who attended school five years or less, the middle third those who attended school from six to eight years inclusive, and the last third those who attended school nine years or more; and as heretofore they are all arranged in columns corresponding to the various salaries they received. Those who attended school from six to eight years are represented by horizontal lines, those who attended five years or less by obliques from upper left to lower right and those nine years or more by obliques in the opposite direction.

It is readily seen that the large majority of the middle third as to school attendance also constitute the large majority of the people who receive the medium salaries or incomes. By actual count we find the number who attended school from six to eight years and who received less than $500 a year to be only eight, while 27 of this group receive more than $1,000 a year. That is, over 77 per cent. of those in the middle third of school attendance receive from $500 to $1,000 a year. Comparing the other two groups, or thirds, we find that of the 172 in the lowest third of school attendance, 136, or over 78 per cent., receive not over $700 a year as salaries, whereas of the 172 in the highest third as to school attendance 133, or over 77 per cent., receive more than $700.

But it may be asked, "What about the considerable number, approximately one-third of the entire five hundred, between whose school attendance and incomes there is no appreciable positive correlation?" For example, turning to Chart IV, it will be observed that there are five people who attended school over six years receiving only $400, and five others with over six years' school attendance receiving only $300. On the other hand in the same chart will be found six people whose school attendance was less than six years, but whose salaries are $1,200, and four with less than six years' schooling whose salaries are $1,400, $3,000, $3,500, $5,000.

An entirely adequate solution or explanation of all the negative correlation need not be undertaken, but there are some facts which strengthen the general conclusion that the correlation is more intimate than the charts indicate. In the first place,

referring to the ten above mentioned in Chart IV whose schooling was more than six years but whose salaries were only three and four hundred dollars it should be said they are women clerks in stores and shops of different kinds. Again in Chart IV, it may be observed that 18 of those receiving only $500 attended school more than six years. Of those eighteen five are women teachers. These fifteen comprise the entire number of women respondents and help to explain part of the negative correlation. That is to say, the data of these somewhat lower the percentage of corrrelation between the amount of schooling and compensation for the reason that women of equal schooling as a rule receive lower wages.

Age is another factor which helps to explain some part of the lack of perfect correlation. By examining the records of the individuals whose school attendance is below six years, but whose salaries are above $1,200 we find that with few exceptions they are men from forty-five to sixty. They appear to be well endowed by nature; they found their life-work early, and have pursued it diligently. The one who receives $5,000 is president of a bank and also a prosperous farmer, age 54. The one receiving $3,500 is postmaster and also president of a large hardware company, age 56. On the other hand the young men who have recently completed high school and college and have gone to productive work are in the main receiving comparatively low salaries because of lack of experience, while their school attendance is of course comparatively high. Then, too, the schooling of the ministers was high as compared to their salaries.

It may justly be argued that the social and financial standing of a child's family will largely influence his income as an adult. That is to say, it is admitted that the child receives much training and assistance in the home, and in his social environment outside the school, which makes for or against his future financial success. But it should be remembered that the social and financial influences which make for the future success of the child likewise contribute to the prolongation of his period of schooling; whereas if the social and financial condition of his family be such as to limit him with reference to his future financial success these

same conditions will likewise tend to decrease his period of schooling. In other words, there is a complete parallelism between social condition in the family and period of schooling. If the facts presented in the above tables with regard to period of school are treated merely as symptoms of a more fundamental fact the interpretation of the result may be more complete, but it will be in no wise in conflict with the obvious implication that there is a marked correlation between school attendance and income in later life.

4. *Conclusions.*—1. That in the five hundred individuals canvassed there is a correlation of about 68 per cent. between the length of time they attended school and their salaries.

2. That in the remaining 32 per cent. of negative correlation fifteen of the cases may be explained by the fact that being women they receive relatively low wages.

3. That age and experience also help to explain part of the negative correlation; young men of more education but less experience often receiving lower salaries than older men of less education but more experience.

# NATURAL HISTORY IN THE GRADES

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## III. THIRD GRADE

A general review of the plants and animals used in grades one and two should constitute the first work in the third grade. This review is needed in order first to keep clearly defined the individual characteristics of different things that were studied and second to recall and re-establish the more difficult matters that were encountered in such processes as relate to climatic changes and the life round of the three types of animal life used most extensively in the second grade. It will be well to introduce into the third-grade room in autumn some cocoons, tadpoles or young frogs by means of which to review and extend the work that was done in the preceding spring. Related types as the salamanders and newts are found as a regular part of the lists of materials suggested for the grade, but these are all the more profitably used if preceded by a brief review study of the toad, the cecropia moth and cocoon, the story of how the pigeons built their nests and reared their young, and by the preparation of lists and brief discussion of the different groups of materials as trees, insects, rocks, soils, and weather phenomena, which have already been studied.

The topics included in this grade are:

1. *Animal life.*—Squirrel or some similar animal kept by the grade; further study of the life cycle and feeding habits of the toad, the salamander, showing its external gills, its form and behavior as compared with the toad; the cabbage butterfly grown through its metamorphoses and the parts mounted to illustrate the life cycle; water insects—dragon flies and mosquitoes, the swimming, feeding, and resting habits of adults and particularly of the young that may be kept in the school-

room aquaria; effects of insects upon garden plants as of the caterpillars upon the currant bushes which are under the especial care of this grade and which when caterpillars appear are sprayed or sprinkled by the grades, some of the caterpillars being kept in cages for study; oriole, song-sparrow, night-hawk, humming bird, brown thrush, blackbird, cow-bird, warblers, a few observations upon bird migration, upon the nesting and feeding habits of these birds, especially upon the ways in which warblers feed upon scale insects upon trees; if possible study in some detail the nesting habits of at least one kind of bird comparing it with the pigeon work done in the preceding grade; some discussion of the balance of life between insects and birds, and in aquaria and ponds between insects and fish, toads, frogs, etc.; add any common land animals of the region not already included in preceding grades, and use true stories descriptive of wild and domesticated animals of this and other regions; the possession of pet animals and children's literature dealing with animal life fit well into this grade.

2. *Plant life.*—In addition to the review of the trees studied in the preceding grade, add the mulberry, box-elder, and two or three others of the most available kinds. Study the form of these and in discussion and sketches establish definite ideas of the characteristics of the different trees that are used. If good enlarged photographs of typical trees of the kinds that are included are placed on the walls they will be helpful, and will be sufficiently unlike those of the vicinity which the pupils are studying to allow all the originality that may be wished. Such photographs may be secured from R. B. Hough, Lowville, N. Y., and also from other sources, but local trees that the teacher or others may have taken in the general vicinity of the school are quite as good and have the additional advantage of the local "color" that adds so much both to teacher and pupil. In the next grade more extended work with the lumber industries is suggested, and this individual study of trees in this grade will assist greatly in the following work.

Acquaintance with plants of the vacant lots of the region should be extended, including the rag-weed, cockle-bur, wild pars-

ley, butter-print, and burdock. The names and general characteristics of the plants and animals that are growing in the aquaria in the room should be made the basis of a few lessons. The most extensive work of this grade is done with the bulbs, which will be separately discussed at the close of this article. This work is carried on throughout the latter part of the autumn, winter, and early spring, both in connection with the garden and with the indoor study.

3. *Garden work.*—Instead of having the whole grade have one, or but two or three gardens, as suggested for the lower grades, a better plan for this grade is to have each group of three or four pupils have a garden together, or if abundant space is available, to have each pupil possess one garden entirely alone. Outdoor studies of the soil, planting, germination, watering, weeding, cultivation, characteristics of the plants in different stages of their growth, and the care that they need to keep them in proper condition are the leading topics that relate to the garden work for this grade. The children make their own plans for their gardens, and under the advice of the teacher select the plants that they are to grow. This must be carefully guarded lest they will select things that are not possible for the region or for the area at their disposal. The suggestions of the teacher are usually sufficient to determine proper selection by the pupil. It will be found best usually to have each pupil grow a few kinds both of vegetables and of flowering plants. A good plan is to divide the bed into a vegetable garden and a flower garden so that all may have a chance at all both useful and ornamental plants that are available for general use. In the next year the pupils are asked to plan for their gardens by making drawings to scale showing just the amount of space to be used and the use to be made of each part of it, and a statement of the appearance that is imagined when the plants are grown. In the third grade this planning is carried on under the close supervision of the teacher. In this way the class and teacher work out the plans before the time for the outdoor work. This serves to increase the interest in the garden and to give definiteness and meaning

to it. In connection with the fourth-grade outline, one or more detailed sample plans for gardens will be presented.

It will be of interest and value to grow in the schoolroom during the latter part of the winter or early spring some of the seeds that are to be used later out-of-doors in order that the pupils may get an idea of the characteristics and appearance of the plants that they are to grow, and may learn to distinguish them from the weeds of the garden.

The earth materials and meteorological materials for this grade are not arranged as separate groups but are treated, in so far as they appear at all, in connection with the garden work. Considerable study of the soil and of the conditions that are favorable for the successful growth of the plants of the garden are constantly discussed, the center of the natural-history work of the grade being the garden and bulb work, hence the inclusion of these things here rather than in separate topics.

4. *The indoor work with bulbs.*—General outlines for this work were given in the October, 1909, *Elementary School Teacher,* to which reference is made, and knowledge of which will be assumed in the following discussion. It is the present purpose rather to give an outline of a few of the detailed problems that the pupils can do with profit in the schoolroom. Enough bulbs should be supplied to allow each pupil to have one each of the kind selected for the main work and also to supply several kinds of less common bulbs for general possession and study by the entire grade. The paper white narcissus, Chinese sacred lily, or hyacinth are probably best for the experimental work. But for comparison there should be provided a good supply of several other kinds, as hyacinths, crocuses, tulip, Freesias, Amaryllis, and scilla. This year part of the children of the grade have been given paper white narcissus, part have been given hyacinths, and the rest Chinese sacred lilies, while the grade as a whole has a few each of several other kinds of bulbs. Considerable discussion as to the best way of planting the bulbs in question was had before the work began, and then each child did his planting under the direction of the teacher.

After planting, the bulbs were well watered and placed in a dark and cool room, where they should be kept for weeks, until after the holiday season unless they grow more rapidly than is expected. They need to be watered just enough to keep the soil from drying out, but care must be taken to see that the soil is not wet enough to allow the bulbs to decay. In this way the roots should start in a short time, and should be well under way before there is any appearance of the stem and leaves. The plants may be brought up to the schoolroom at any time after the roots are well started, and forced for winter or early flowering. Some of the potted bulbs may be planted out-of-doors by being buried in the soil or under straw, and may be brought into the schoolroom at any time that is wished. Great care must be taken to see that the earth and plants thaw out very slowly else the plants will be killed. This is best done by putting the pots first into a cool basement room for a few days, then into the schoolroom.

With the planting done, experimental work with the bulbs and a study of their parts is begun. One study as suggested by the following directions, consists of opening tulip bulbs lengthwise to determine what parts are present and how they are arranged with reference to one another. By use of a bulb that has stood in water for a few days determine where the roots arise, where the stem is, how the leaves are arranged and how they inclose the growing point. This study should be carried farther by use of bulbs that have been cut crosswise, and sketches of the bulbs in different views should be made. By use also of one or two bulbs that have been planted for a week or ten days the nature of the different parts will be interestingly shown. From this point of view further study may be made of similar bulbous plants that are growing in the room.

Another experiment that has proven valuable consisted of growing three sets of plants in different places which afforded different lighting and possibly different temperature. The pots were placed in a dark closet at the time when the bulbs were planted and others, planted at the same time, were placed in the windows, and still others in a dark cool basement room as previously described. The closeted plants developed root systems, but

produced blanched leaves and no flowers, those placed in the window soon put up their leaves and flower stocks but had developed meager root systems and finally produced small and but few flowers, while the plants that were started in the basement produced abundant roots and when brought up to the schoolroom produced large leaves and large and abundant flowers. Much interest was shown in following the development of these three groups of plants grown under different conditions. A fourth group of potted bulbs has been buried out-of-doors, and when it is brought into the room it doubtless will serve excellently as a comparison with the three groups here described, and should make possible valuable inferences as to the behavior of bulbous plants relative to soil, temperature, and light.

Another valuable series of experiments consists in determining the amount of water used by a plant and the relation of this to the amount of growth of the plant. In a fruit jar a measured amount of water was placed. Suspended to a stopper in the top of the jar a bulb was fastened, so that its lower end touched the top of the water. The cork was sealed with paraffin so that no evaporation of water from the jar could occur. The entire apparatus was weighed carefully and the weight recorded. Sketches were made of the apparatus at intervals to show the changes as they occurred. Gum labels placed on the outside of the jar served to determine whether the water was lowered from day to day. When the water was lowered and the growth such that the weight remained practically constant, interesting questions arose as to whether the growth took place directly from the water removed from the jar. Obviously some simple explanations were necessary, such as the statement that the plant took some of its food from the air about it. A further instructive experiment consisted in comparing the weight of a bulb with the weight of the whole plant that finally grew from it. It may be questioned if in this experiment we are not dealing with factors some of which are too elusive for pupils even much older than these and we must recognize that such is true. But the gross results were determined, and farther than this it would be unwise to attempt to go with children.

In one class the experiment with the bulb grown in a jar led to a study of the amount of water in the soil. The class weighed some soil, then dried it carefully, of course not being able to remove all of the water, but removing all that ordinary drying would remove, and then by weighing the dry soil determined the loss by weight, which, as they could readily understand, was a water loss. It is not intended that any extended study of the soil should be taken up until in the fifth grade. Many interesting experiments offer themselves in connection with this study; the reaching for light by plants, as shown in the window or by plants inclosed in a box so as to be lighted from but one side, budding, flowering, and seed-making, depth of planting that gives best results, differences between growth from large and small bulbs, and from those that were used by the class last year and new bulbs.

Two somewhat special features of the bulb work are being tried in this grade this year. One is to have the children grow a dozen or so pots of especially fine varieties as the newer hyacinths, crocuses, and Freesias, which, if successful, the children will present to other grades or to outside interests to which the grade may wish to contribute. Secondly, a fine Amaryllis has been secured for this grade which the grade is expected to care for and pass on at the opening of the next school year to the next third-grade class. It is hoped that another Amaryllis may be cared for by this grade and carried through all of their grade experience, and disposed of as they see fit when they finish the eighth grade.

# AGRICULTURAL EDUCATION

## AGRICULTURAL COLLEGES, INCLUDING EXTENSION WORK, DEPARTMENTS OF AGRICULTURAL EDUCATION, AND SUMMER SCHOOLS FOR TEACHERS

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Of the many agencies now promoting agricultural education in elementary and secondary schools the most important are the state agricultural colleges, for they are the "only teaching institutions that are in possession, at first hand, of the essential facts of rational agriculture." Until recently they have been too busy perfecting their own organization, and too greatly occupied in developing and promoting the scientific aspects of agriculture to give much attention to outside educational matters. It is difficult to determine just when the agricultural colleges began to take an active interest in the public schools. Dean L. H. Bailey says:

> More than any other institutions they stand for democracy and nativeness of education, for their purpose is nothing less than to reach the last man on the last farm by means of the very things by which that man lives (28, p. 40).[1]

This idea of bringing the college to the people found its first expression in various sorts of extension work dealing with the farmers directly. Now this work is well organized and is doing great service. Through farmers' institutes, farmers' conventions, farmers' excursions to the college, instruction trains, demonstration farms, and other means, the man on the farm is having the college brought to him. These efforts of the colleges are now appreciated; so much in fact, that it is often difficult for a college to meet the demands for this kind of outside instruction. But the farmer has not always had this friendly attitude. He was slow to recognize the value of what he called "book farming." Perhaps it was in these early days of agricultural extension that

[1] The references are to the bibliography at the end of this article.

some of those in charge thought it worth while to give some attention to the coming generation of farmers, to the children in the public schools.

Doubtless many individuals connected with agricultural colleges had put this idea into practice and had helped to introduce agricultural subjects in some of the public schools long before any college took official notice of this means of extension. The first college to take this matter up was the Agricultural College of Cornell University. Reference has already been made to this work under the Nixon law of 1897.[2] It assumed considerable importance at once. The report of 1898 concerning this work says:

> Thirty thousand teachers are enrolled on our lists and have received leaflets, and many have attended lectures explaining the methods of presenting nature-study work in the schools. Sixteen thousand children have received those leaflets which are especially adapted to their needs (20, p. 1611).

This work is administered by a department of the college known as the Nature-Study Bureau and consists of publications, correspondence, organization of boys' and girls' clubs, and lectures and demonstrations for teachers. Other agricultural colleges soon took up similar work in their respective states until now nearly all are doing more or less extension work among the public schools. At present agricultural colleges are assisting agricultural education in the elementary and secondary schools (*a*) by various extension methods, (*b*) by organizing departments of agricultural education and (*c*) by conducting summer schools for teachers.

Extension methods vary somewhat in different states. This is probably due to differences in local conditions, state support, and policies of the colleges themselves. Usually each college develops one particular method of reaching the schools although it may use several. Several colleges follow the Cornell plan (29, 30) of regular publications for teachers and pupils, for example, the agricultural colleges of Kansas (31), Ohio (32), New Hampshire (33), and Rhode Island (34). Purdue Uni-

[2] This *Journal*, Vol. X, No. 4, p. 169.

versity, Indiana University, and Pennsylvania State College published regularly for a while leaflets on nature-study. Others publish occasional bulletins on various phases of public-school agriculture, for example the agricultural colleges of Massachusetts (35, 36), Illinois (37), Minnesota (39), Tennessee (38), and California (40). Material designed to aid teachers is sometimes prepared by faculty members of an agricultural college to be published by the state department of education or by some school magazine, for example from the agriculaural colleges of Illinois (42) and Michigan (41).

These extension publications are distributed free of charge and often large editions have to be reprinted to meet the demand. The extension bulletin of Ohio State Agricultural College (32), for example, is printed in editions of from 10,000 to 20,000. The mailing-list is made up anew each year from responses to notices that names will be dropped from the mailing-list unless requests are renewed. Pupils of the public schools are expected to carry on some work suggested by the college and report upon this work in order to receive the bulletin regularly. In this way the extension department is kept in close touch with the teachers and pupils of the state. The bulletin serves several purposes: it is a means of communication between the college and the schools; it presents various phases of agriculture of interest to the pupils; it assists in organizing agricultural clubs among the public-school children; it is the organ for promoting interest in rural-school improvement, such as consolidation of rural schools and beautifying school grounds.

Each agricultural college has more or less correspondence among teachers and pupils but some colleges have encouraged it and made it a feature of their extension work. This method has the advantage that comes from establishing a sort of personal relation between the college and the individual. But the work involved in a correspondence dealing with several thousand individuals is enormous and almost impossible for an agricultural college, were personal answers given to each letter. A regular publication is necessary to outline and suggest work to be re-

ported upon. The correspondence is really one-sided, for answers to individual letters may be given in the next publication or in circular letters. Only a small percentage requires personal answers. The office work is thus reduced to filing and checking reports and preparing mailing-lists. The most extensive work of this kind has been carried on by Cornell University. "Uncle John," who is supposed to read the letters, is more widely known and is more popular among the young people of New York rural communities than any other member of the university. This method is also used by the agricultural colleges of Ohio and Rhode Island. The Agricultural College of Florida conducts a correspondence course in agriculture for teachers, enrolling in 1908–9, 438 teachers.

The most successful form of agricultural extension among public-school children has been agricultural clubs (43, 44). They are now organized in nearly every state and are not only a means of imparting a knowledge of agriculture to their members, but they have a wholesome reaction on the communities in which they are organized. The following is a statement of the work of boys' clubs of Louisiana:

> This year, 1909, we have about 2,000 boys in our agricultural clubs. Next year we expect to have 10,000. I shall devote all of December, January, and February to the organization of these clubs in every parish in Louisiana. The corn crop in Louisiana this year exceeds in yield by 50 per cent. the crop of 1908, and it is generally admitted that a large part of the increase is due to the interest created in corn during the last two years by the boys that are in the boys' clubs. The best corn show ever held in Louisiana was that of the boys' clubs at the State Fair at Shreveport the first days of this month.[3]

The most complete state organization of boys' and girls' clubs is in Nebraska (43). Here the State Agricultural College and the State Department of Education work together. The organization consists of a state association, and county and local or district associations. The central or state association meets once a year and is composed of delegates from county associations.

> A special course in agriculture and domestic science for boys and girls will be given at the State University Farm, beginning Monday, January 17,

[3] From a letter of Professor V. L. Roy, Department of Agricultural Education, State Agricultural College of Louisiana.

and ending Friday, January 21, 1900. This course is planned for the delegates from each county of boys' and girls' agricultural and domestic science associations. Special arrangements have been made with the professors at the University College of Agriculture to give a course of instruction lasting five days. . . . . The laboratories at the Agricultural College will be at the disposal of the delegates from the different counties during this week and professors from the college will give the instruction. The course is filled with interesting and instructive lectures and demonstrations (43, p. 11).

The agricultural colleges reach the public schools in various other ways. The extension department of Ohio State Agricultural College gives its attention almost wholly to rural schools. The superintendent of agricultural extension in this institution believes that the most important work of his department lies in improving the rural schools, not only by helping to introduce agriculture, but by interesting the patrons in consolidating small district schools, in making other improvements, and by encouraging the teachers to adjust their school work to fit the needs of the communities in which they live. The Mississippi State Agricultural College gives a short course of one week each winter in the county agricultural high school. Many colleges send representatives to address teachers' institutes and other teachers' meetings. They also furnish judges for boys' corn shows, and corn and stock-judging contests.

The early extension work of agricultural colleges among the public schools was intended to awaken an interest in agricultural affairs. It was mainly propaganda for arousing a favorable sentiment toward the subject. The more recent work has had for its aim the actual introduction of certain phases of agriculture into the schools, and to render assistance to teachers who wish to teach the subject. The demand on many colleges for this kind of work has become too great to be properly met by the regular extension departments. To meet this situation special departments are being organized. These are usually known as departments of agricultural education. In the Agricultural College of Minnesota the department is called agricultural pedagogics, and in the Agricultural College of Missouri it is called the department of rural school education. The following tabulation shows the organization of these departments up to date:

| State | Year | Head of Department |
|---|---|---|
| Alabama | 1909 | L. W. Duncan |
| California | 1909 | Ernest B. Babcock |
| Illinois | 1905 | D. O. Barto (secondary agr. ed.) |
| | 1909 | Fred L. Charles (elementary agr. ed.) |
| Indiana | 1908 | George L. Roberts |
| Idaho | 1909 | Edwin E. Elliot (O. M. Osborne, asst.) |
| Louisiana | 1909 | V. L. Roy |
| Michigan | 1908 | Walter H. French |
| Massachusetts | 1907 | W. R. Hart |
| Minnesota | ? | D. D. Mayne |
| Missouri | 1909 | R. H. Emberson |
| Nebraska | 1909 | J. L. McBrien (University extension) |
| North Carolina | 1909 | I. O. Schaub |
| Oklahoma | 1909 | E. E. Balcomb |
| Pennsylvania | 1909 | Thos. I. Mairs |
| Wisconsin | 1909 | K. L. Hatch |

The agricultural colleges of Arkansas, Delaware, Maine, North Dakota, South Dakota, Vermont, and Washington give courses in education to their students who expect to become teachers. The Agricultural College of Tennessee added a department of agricultural education temporarily in 1908 for one year and expects to re-establish it. A number of other colleges have signified their intention to establish departments of agricultural education as soon as practicable.

It will be seen from the above summary that most of these new departments began their work in 1908 and 1909. This is probably due, at least in part, to a provision of the Nelson amendment of 1908 (*22*, *28*, p. 5) whereby "said colleges may use a portion of this money (referring to additional appropriation) for providing courses for special preparation of instructors for teaching the elements of agriculture and mechanic arts."

Massachusetts in 1907 made a special appropriation of $5,000 for this work (*28*, p. 41). In addition to the regular instruction given during the school year and summer school for teachers, the department conducted, in 1908 and 1909, conferences on agricultural education (*36*). At the conference of 1909, a committee appointed in 1908 made a report outlining a series of exercises "of experimental character that should serve as material for the teaching of agriculture in the common schools" (*35*).

The departments of agricultural education in other colleges are just getting under way, and it is therefore not possible at

this time to give any report of their work beyond a few brief statements. Boys' clubs and teachers' institutes are receiving special attention in several states. In Missouri the schools of the county in which the University of Missouri is located are taking up the study of agriculture under the direction of the professor of agricultural education who visits the schools with the county superintendent, gives instruction in the seventh and eighth grades and makes suggestions to the teachers for carrying on the work. The University of Illinois is pursuing a similar plan. In Indiana the department was established especially to enable the students of Purdue University to comply with the state law requiring teachers in the public schools to have some professional training. In general, these new departments seem to regard the development of agriculture in high schools as an important part of their work. Mention should be made in this connection of the co-operation of the College of Agriculture of Cornell University and Teachers College of Columbia University for the training of students for special work as teachers of agriculture in high schools and normal schools. "Appropriate courses in agriculture are taken at Cornell University and the study of educational problems at Teachers College" (28 p. 36–37).

The number of agricultural colleges giving summer courses for the benefit of teachers is increasing rapidly. During the present year courses were given in the agricultural colleges of the following states: Connecticut, California, Georgia, Illinois, Massachusetts, Michigan, Minnesota, Mississippi, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Tennessee, and perhaps others. These courses last from three to eight weeks and are well attended. The indications are that the attendance and interest will increase and that summer schools of agricultural colleges will become a considerable factor in elementary and secondary agricultural education.

## BIBLIOGRAPHY

Only publications referred to by number in the text are given. In this list will be found representative publications of agricultural colleges concerning various phases of agricultural education. No attempt has been

made to make it complete. Many of the facts of the text have been obtained from personal letters.

28. *On the Training of Persons to Teach Agriculture in the Public Schools.* LIBERTY HYDE BAILEY, Washington, D. C.: U. S. Bureau of Education, Bulletin No. 3 (1908), pp. 53.

    The subject is discussed in three parts: I. The nature of the problem in (*a*) elementary schools, (*b*) high schools, (*c*) special schools; II, The means of training the teachers (*a*) those already in service, (*b*) new teachers; III, The general outlook; the significance of normal work in the colleges of agriculture.

29. *Cornell Nature-Study Leaflets.* New York State College of Agriculture of Cornell University, Albany, New York: State Department of Agriculture, Nature-Study Bulletin No. 1 (1904), pp. 607.

    This volume is made up of selections, with revisions, from the Teachers' Leaflets, Home Nature-study Lessons, Junior Naturalist Monthly, and other publications from the College of Agriculture of Cornell University.

30. *Rural School Leaflet.* New York State College of Agriculture of Cornell University, Ithaca, N. Y.

    Vol. I of this publication began in September, 1907. It is published monthly in the interest of the rural schools. It takes the place of the various other nature-study publications sent out by this institution: *Teachers' Nature-study Leaflets,* beginning in 1897; the *Junior Naturalist,* from 1901 to 1904; *Nature-Study Quarterly,* beginning in 1899; *Home Nature-Study Lessons,* beginning in 1900, new series in 1904.

31. *Agricultural Education.* J. H. MILLER, editor. Manhattan, Kansas: Kansas State Agricultural College. Vol. I began November, 1908.

    No regular dates of publication are announced, but it is intended that at least four numbers will be issued each year. Each number takes up somewhat in detail some one subject; Vol. I, No. 1, *A Corn Primer,* pp. 46; No. 2, *Plant Breeding,* pp. 92; No. 3, *A Study of Insects,* pp. 52; No. 4, *Insects Injurious to Farm Crops,* pp. 91; No. 5, *Boys' and Girls' Contest Number,* pp. 22.

    An educational series of four numbers appeared in 1907, being special editions of *The Industrialist,* a weekly publication of the College. Previous to 1907 occasional numbers devoted to agricultural education appeared from time to time.

32. *The Agricultural College Extension Bulletin.* A. B. GRAHAM, editor. Columbus, Ohio: Ohio State Agricultural College. Vol. I began October, 1905.

    Each volume consists of nine numbers published monthly. Each number treats some subject of interest to teachers and pupils of rural schools. Each year one number is devoted to the centralized schools in Ohio.

33. *New Hampshire College School Bulletin.* E. DWIGHT SANDERSON, editor. Durham, N. H.: New Hampshire State College of Agriculture. Vol. I began May, 1908.

This is a quarterly publication in the interest of New Hampshire schools. Contents of Vol. I, No. 1, *Agriculture through the Rural Schools;* No. 2, *Soil Studies;* No. 3, *Seeds and Seedlings;* No. 4, *Seed Testing.*

34. *The Nature Guard.* A. E. STONE, editor. Kingston, R. I.: Rhode Island State College of Agriculture. Vol. I began October, 1899.

This leaflet is issued monthly from October to May. It is the official organ of the Nature Guard and Junior League of Improvement Societies of Rhode Island. Each number has from four to eight pages and is usually devoted to one subject; for example, the title of No. 63. is *Experiments with Soils.*

35. *Public School Agriculture.* W. R. HART. Amherst, Mass.: Massachusetts State College of Agriculture. Special Bulletin (1909), pp. 32.

This is the Report of the Committee Appointed at the Conference on Agricultural Science at Amherst, Mass., 1908. Fifty-four exercises in elementary agriculture are outlined.

36. *Proceedings of the Conference on Agricultural Science. Ibid.* (1908), pp. 43.

Four papers are published as follows: "The Place of the School Garden in the Development of Science Teaching," W. A. Baldwin; "Administrative Phases of Agricultural Instruction," C. H. Robison; "Physics and Agriculture," R. W. Guss; "Chemisry and Agriculture," Charles Wellington.

37. *Extension Bulletins Relating to Agricultural Education.* Illinois State Agricultural College, Urbana, Ill.

*Consolidation of Country Schools,* E. Davenport (1903, 2d ed., 1904), pp. 56. *Developing the Farm Boy,* Fred H. Rankin (1905), pp. 26. *The Grout Farm Encampment,* Arthur J. Bill (1906), pp. 42; *Second Encampment, ibid.* (1907), pp. 40. *Dairy Lessons,* Wilbur J. Fraser (1907) four parts, one lesson in each. *The Next Step in Agricultural Education,* E. Davenport (1908), pp. 22. *Sugar Beets and How to Grow Them,* Fred H. Rankin (1908), pp. 7. *How to Run Farm Machinery,* Fred R. Crane (1908), pp. 39.

38. *A Manual for High Schools.* JOSIAH MAIN.. Knoxville, Tenn.: Tennessee State College of Agriculture. Special Bulletin (1909), pp. 32.

A scheme for correlating agriculture with other high school sciences is worked in with considerable detail.

39. *Rural School Agriculture.* W. M. HAYES *et al.* St. Anthony Park, Minn.: University of Minnesota, Bulletin No. 1 (1903), pp. 200..

"Exercises in this bulletin . . . . have been prepared for use of teachers in the rural schools of Minnesota." This publication is of especial interest because it represents one of the first efforts of agricultural colleges to assist teachers by preparing concrete lessons in an agricultural subject. A revised edition of this bulletin appeared as Bulletin No. 2 in 1907. A comparison of the two bulletins shows an interesting shifting of point of view as to matter presented and method of presentation.

40. *Suggestions for Garden Work in California Schools.* E. B. BABCOCK.

Berkeley, Cal.: California State Agricultural College, Circular 46 (1909), pp. 48.

This contains a history of the movement, what teachers have done, what teachers can do, instructions for teachers beginning garden work, how to secure special preparation for teaching nature-study within California and list of publications.

41. *An Elementary Laboratory Study of Crops.* Jos. A. Jeffery. Lansing, Mich.: State Department of Education, Bulletin No. 26 (1907), pp. 28.
*An Elementary Laboratory Study in Soils.* Jos. A. Jeffery. *Ibid.* Bulletin No. 27 (1908), pp. 36.
*An Elementary Course in Horticulture.* S. W. Fletcher. *Ibid.* Bulletin No. 28 (1908), pp. 31.

42. *The Study of Farm Crops, Farm Animals, Horticulture and Agriculture.* A. D. Shamel, E. Davenport, and J. S. Blair. Taylorville, Ill.: C. M. Parker, *The School News* (1900–4).

About fifty short articles on the above subjects were published in the *School News* and afterwards reprinted by the publisher in form of leaflets, and sold at one cent each in quantities of ten or more. They had a wide sale and no doubt contributed much toward arousing an interest in agriculture in the public schools of Illinois.

43. *Nebraska Boys' and Girls' Association State Contest and Convention.* Val. Keyser and E. C. Bishop. Lincoln, Neb.: University of Nebraska, Bulletin series XIV, No. 12 (1909), pp. 20.

This bulletin contains announcement of the State Convention of 1910 of the Boys' and Girls' Association of Nebraska. Other bulletins concerning this Association have appeared from time to time, e. g., *Selecting Corn for the Contest,* Ser. 12, No. 25; *Planting Corn for the Contest,* Ser. 12, No. 12 (1907); *Selecting Potatoes for the Contest,* Ser. 13, No. 11 (1908); *Cooking and Sewing,* Ser. 13, No. 14 (1908).

44. *Boys' Agricultural Clubs.* D. J. Crosby. Washington, D. C.: U. S. Department of Agriculture, Yearbook for 1904, pp. 489–96.

This article gives a description of "the boys' exhibit of corn at the Louisiana Purchase Exposition, the development of boys' clubs in Illinois and other states, and school fairs; and discusses the educational value of the work done by such organizations."

# THE FINE AND INDUSTRIAL ARTS IN ELEMENTARY SCHOOLS, GRADES IV AND V

WALTER SARGENT
The University of Chicago

The previous article in this series stated that one distinguishing characteristic of the beginnings of manual expression is satisfaction in occupation, almost regardless of the product. Later appears an interest in the quality of the product and a desire that it be a somewhat adequate expression of an idea. This interest gives value to the sort of intensive work suggested for Grades II and III, where in addition to the free drawing and constructive work used as a means of describing ideas of current interest, a few things were to be selected and studied somewhat thoroughly in a series of lessons, each one of which presented or emphasized some particular aspect or detail of the object or process of construction. In these careful records of observations drawing ceases to be merely the making of symbols that can be recognized when used as illustrations of a story, and becomes a sincere effort to interpret truly a particular object. For example, if the drawing is of a Norse boat, the children forget for a time the historical associations in the attempt to represent that special form of boat correctly. A new interest enters in: that of trying to make the particular thing in view exist again on paper. The drawing has a content of its own. When after such drawing the children turn again to illustration of history requiring the Norse boat, they do so with increased power of expression. The results of intensive study of this sort should be a relatively thorough knowledge of a few objects, geometric relations, and processes, with a corresponding confidence in the use of them, and the satisfaction that arises from having mastered certain definite things, and from a realization that well-directed, persistent effort is likely to bring desired results.

In constructive work the teacher of manual expression has early to decide between a policy that leans toward giving children the freedom of all tools and materials at as early an age as these can be handled with safety—for example, bench tools for wood-working in primary grades—or toward utilizing somewhat completely the possibilities of simpler materials and implements, regarding these as adequate to that stage of expression and a fitting introduction to more difficult undertakings. Where the second policy is adopted and interpreted freely, the pleasure of thorough accomplishment usually makes the need of stimulation by novelty less urgent. The incitement of new tools and materials can be reserved till appropriate times. Thus may be avoided the necessity for continually checking the development of the ability to enjoy exploring the possibilities of a few things, and for interfering with the habit of undertaking whatever task is at hand with courage and good will.

The mastery of one implement and process after another may be so guided as to aid rather than hinder originality, and is ultimately necessary to freedom of expression. Such mastery develops those worthy accompaniments of free expression, namely appreciation of technical skill and constructive honesty, ability to think constructively, to plan processes intelligently, and to experience the satisfaction of contributing a piece of work that is well done.

In the desire to develop originating power and not simply technical excellence, we should not lose sight of the importance of developing also the inclination and skill to carry projects to completion and not simply to originate them.

Manual expression should awaken pleasure in the sort of work which requires sustained effort. This should not be confused with the pleasure in spontaneous play. Every man should find pleasure in his work and in his play, but no sane man continues play after it has become irksome, and no man of character drops his work whenever it is irksome. The interest arising from the projection or presentation of new things is easily awakened. The interest which is developed by carrying a project through to completion after the first burst of enthu-

siasm has passed is of a much slower growth but is more trustworthy, and if systematically strengthened, becomes a motive which can be relied upon.

We turn with aversion from the sight of a school where children are trained simply in mechanical processes. They are making with their hands things which their desires had no part in suggesting nor their heads in planning. But the other extreme, that of a group of earnest, highly trained teachers compelled to spend their best strength trying to make any serious work seem worth while to classes of blasé upper-grade or high-school children who have "had it all before," and who regard these efforts with mild contempt, is a phenomenon that occurs with sufficient frequency to merit consideration.

Such children have been deprived of the sort of work-interest which is necessary to save work from becoming commonplace. A man is unfortunate who has never been trained to suggest and direct his own work, but on the other hand, a large part of one's work will inevitably consist in dealing with matters one never suggested nor desired. One is also unfortunate who has never developed a habit of dealing with such matters cheerfully and effectively simply because they are there and must be done.

The following suggestions for work in representation, construction, and design emphasize the points in technical development which the abilities of the children seem to indicate as particularly appropriate to these grades, and which are factors necessary to freedom of expression.

*Representation.*—Grades IV and V present an important problem to the instructor in drawing. In many exhibitions of drawing one is impressed by the spontaneity and vigor of graphic expression during the first three grades, and by the failure in the upper grades of any adequate fulfilment of the promise given in the lower. If, seeking a reason for this, we visit schools and watch children at work, we usually find, as was suggested in the last article, that during the second year in school, and more especially during the third, there is added to interest in the mere activity of drawing an interest also in the

quality of the product and a desire that it represent the object more adequately. This suggests that failure to make reasonable progress after the third or fourth year is due either to continuation of general drawing without emphasis of particular phases appropriate to the needs of these grades, or to a too abrupt change into adult methods. The intensive study of a few objects, to each of which a succession of lessons is devoted, was suggested for Grades II and III, to meet this changed attitude of the children toward their work and to make certain that ability to draw should keep pace with appreciation of representation.

At some time near the fourth year in school most children appear to lose interest in making crude sketches. They become conscious of and are in danger of being discouraged by their lack of skill. The sort of direction given to their observation and expression determines largely the development of ability during the remainder of the school course.

The method most commonly followed at this time is to introduce the study of the principles of perspective, especially those relating to foreshortened circles and to rectangles at different levels above and below the eye. While the knowledge of these principles is necessary to correct delineation, the application of them to actual objects is a complicated process, and anything more than an incidental reference to them requires greater expenditure of time and effort than is justified in these grades. The children are so fully occupied with direct comparison of object with drawing in the attempt to make the representation "look right" to the eye that they can seldom be led to refer for intellectual confirmation, to a principle which defines how the thing should appear under the given conditions. The immediate impression resulting from comparing the visual image of the object with that of the drawing to see if they fit is the important factor. The questions, "Does it look like that object?" and "How can you make it look like that?" are usually more effective at this age than explanations of the technical grammar of graphic expression. If the child's own observation will not carry him far enough, sketches made for him, which

satisfy his eye, will usually interpret the facts of appearance sufficiently to enable him to express the problem in hand.

It seems wiser, therefore, during the fourth and fifth years in school to treat perspective effects incidentally, and postpone, if possible, problems involving definite study of them. This gives time for necessary practice with things easily understood, instead of requiring children to learn advanced principles without experience sufficient to make them practical working schemes.

The latter method often results in an accumulation of formulae for representing perspective appearances, rather than a trustworthy working knowledge. It is a difficult task to induce a child in these grades to draw a book correctly in perspective. When it is successfully done it is usually an indication that he has followed his instructions, rather than that he has seen the thing as he has represented it.

An important matter, and one which appeals strongly to children at this age, is that of correct proportions as a necessary element in truthful and satisfying representation. They readily discern whether a drawing is "too tall" or "too short" as compared with the object, and they develop ability to estimate relative lengths of parts with some degree of precision.

For example, in such a drawing of a toy boat as Fig. 1, a child will take great interest in representing the hull of the boat in its proper proportions, and in adding the keel so that its size bears the right relation to the hull. He can easily be led to proceed with much care, showing just where the mast should be placed and how tall it should be to be like the model. In a similar way he may be led to find much satisfaction in estimating the slant and length of each line with considerable accuracy. Constructed objects such as toys offer excellent opportunity for drill in the matter of correct proportions. Some such drill in correct drawing is necessary to mastery of this means of expression. Without it drawing may easily become a promoter of careless habits, and the interest in doing a thing well may remain unawakened.

A common method of obtaining correct proportions is to

hold the pencil at arm's length and use it as a measure. Aside from the fact that it is practically impossible to teach young children to use this method with any trustworthy results, the assistance obtained by such measurements, even when they are skilfully taken, is of extremely doubtful value for children. Progress in ability to draw correctly depends largely upon the power to compare visual images and discern their likenesses and

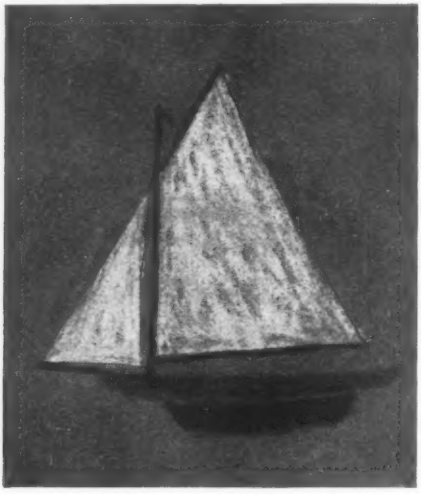

FIG. 1

differences. Pencil measurements substitute a mathematical computation for a visual perception.

For example, in Fig. 2 the pupil can measure and ascertain that the width of the tumbler at the top is two-thirds of the height of the image, and with this information can plan his drawing correctly. On the other hand, if he will indicate the top and bottom of his tumbler by lines of indeterminate length and place two splints to represent the sides, moving them till the included shape satisfies his eye, he will discover that he can thus determine the proportions with great accuracy. If one looks at *a*, which is the shape to be represented, and then at *b*,

he sees immediately that *b* is too narrow, while the image of *a* fits that of *c*, and the similarity of proportions satisfies the eye. The source of this satisfaction is not due to any confirmation from a mathematical estimation of width and height but to an immediate sense of correspondence of images. This sense develops rapidly with exercise. In Grades IV and V much should be done toward training the eye to swift and unerring discrimination. Unless this is done drawing will be as halting and uncertain as are mathematical processes when the worker is not sure of the multiplication table.

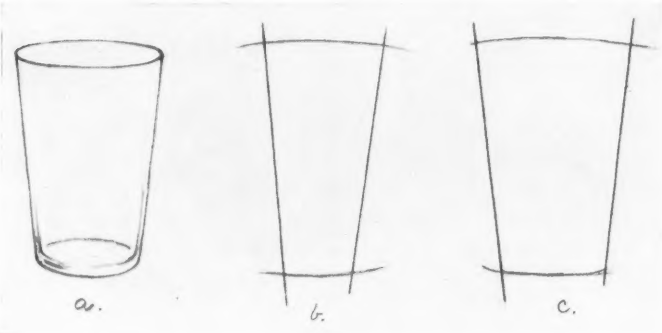


FIG. 2

Pencil measurements might be recommended as a final verification, except for the fact that they are seldom so trustworthy, even when carefully taken, as the visual perception which has received an amount of training equal to that required for the mere process of learning to take pencil measurements.

The representation of objects by splints gives excellent practice in judging proportions. There are no lines to be erased. Such representation is a helpful introduction to drawing the object with pencil.

The sort of observation which leads to most perceptible progress often may be stimulated by having pupils exchange seats and talk over the drawings made by other children, in-

dicating by sketches or otherwise how they think improvements may be made.

To avoid mechanical slowness there should be alternation of lessons in making rapid sketches which express as much as

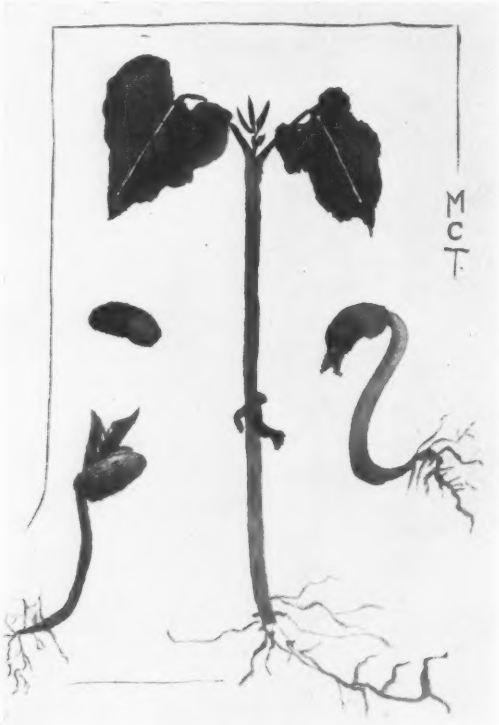


FIG. 3

possible by a few lines or brush strokes, with other lessons where a single drawing is carried to completion by being worked over and made as correct as possible.

Nature drawings in water color or brush and ink call for careful representation of proportions and shapes as well as beauty of form and character of growth (Fig. 3). As an

accompaniment of drawing, modeling is an exceedingly valuable means of leading children to appreciate characteristics of objects and to think of them as occupying three dimensions.

*Construction.*—Skill to handle new implements and more refractory materials, a greater satisfaction in good workmanship, and ability and willingness to undertake more careful preparation in the way of plans and patterns before cutting into the material for final construction, are noticeable in children in these grades as compared with those in Grades II and III. Problems will vary with the conditions of different localities. Some instructors prefer to use constructive work as a center for other subjects. Others plan a course to develop appreciation of industries and occupations, and still others choose as a basis for problems, the immediate needs and interests of school and home. Whichever line is emphasized, much of what is valuable in the rest may be included, and in any case opportunity will be offered for experimentation with plans and designs and for increased mastery of tools and materials.

The following recommendations are based on the line of work which finds its suggestions chiefly in the needs and interests of the particular school and home environment. Children are usually ready to propose an abundance of practical projects.

Many objects useful and interesting to the children may be made from tough paper and later from cardboard. This material can be shaped by folding, cutting, and pasting so easily that it stimulates invention and is especially adapted for objects which are to be planned by means of patterns. Continued use of the rule with the addition of compasses and 45°-triangles and more complete control of scissors give children the mechanical means for planning and completing objects.

Envelopes for street-car tickets, Christmas cards, invitations, clippings, etc., call for careful patterns and measurements so that the envelope may be of the required size. Picture mounts, portfolios, sketchbook and lesson covers, and boxes of various kinds are among the suitable objects.

The sort of working-drawing required in making patterns for these, acquaints children early with this means of pre-

determining the shape material shall take, and is the best sort of preparation for later making drawings which represent three dimensions. Some of the patterns involve drawing to scale and translating two dimensions into three.

With vellum, lining papers, tape, paste, sewing-linen, and a punch, the cardboard work may be extended to include interesting and simple forms of book-binding, for example, notebooks, pocket

FIG. 4

memorandum pads, needle cases, book covers, portfolios, clipping files, etc. (Fig. 4).

Weaving is an occupation of universal interest. It develops some acquaintance with textiles and processes and calls for knowledge of design and color. The looms for small articles may be of the simplest construction, such as can be made by the pupils themselves. Clay work in tiles and simple pottery shapes is another valuable medium of expression of form in definite terms, and together with weaving furnishes a means of developing concrete interest in some industries of the present and past. Some of the domestic activities of sewing and cooking should

form an important part of the work of these grades, especially of Grade V.

Simple forms of woodwork which can be done mostly with the knife are well adapted to these grades and give some familiarity with the material which is useful as an introduction to bench work in upper grades. For most of this work, thin wood which can easily be prepared in the rough and does not require bench tools, is sufficient.

Among the projects most frequently suggested by the children are pencil sharpeners, pen and pencil boxes, paper cutters, brush and water-cup holders, string and fishing-line winders, windmills, weather vanes, waterwheels, games, models for bridges, derricks, etc., toy carts, sleds, boats of various kinds, kites, flying machines, tops, pin-hole cameras, toy houses and furnishings, bird houses, etc.

*Design.*—The two places of design before described, that of practice in repeating units at consistently related intervals, and that of planning and decorating objects, should continue.

In addition to borders previously suggested, pupils should repeat units over surfaces, spacing the distribution by the eye unaided by mechanical measurements (Fig. 5).

The spacing of printing on covers for school work, the planning of margins, titles, etc., on school papers, so that language, spelling, and arithmetic papers may present a good appearance, and the simple decoration of constructed forms, furnish appropriate problems. When an object is to be decorated it is usually best at this age to limit and define the problem. For example, if a folder or box cover is to be ornamented the element of decoration may be limited to a plain band border. The pupils then experiment with different widths of margins and of border lines, to determine the spacing which produces the most pleasing effect. Another example may be the careful spacing of one element on a given surface, such as a title to be printed upon a cover.

In all these problems the results depend for their effect upon well-related spaces. The cover titles are printed in plain letters carefully planned so that the letters will appear neither crowded nor scattered, and so that the completed title shall exactly fill

the area previously determined for it on the page. By thus limiting the elements which children are allowed to use attention is concentrated upon an attempt to make the best possible

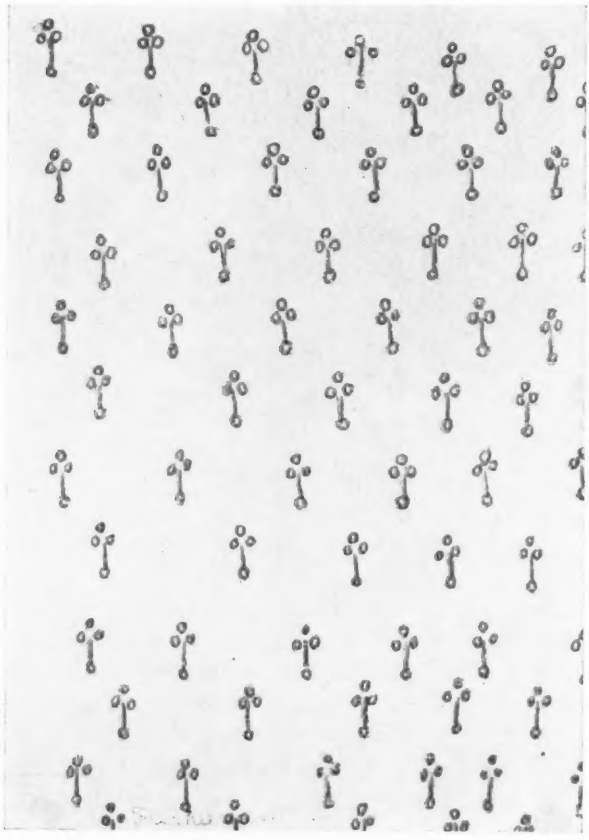

FIG. 5

arrangement of what is given. This tends to develop appreciation of consistently related spaces which is a fundamental element in good design. It is necessary for children to learn that the most important question in design is not how much can be in-

cluded in the space, but what is the best disposition of appropriate material. This can be emphasized at first by furnishing the elements and leaving to the children only the problem of their disposition, which at this age is fully sufficient.

When the given elements are simple, children in the fifth grade usually choose the best spacing, if they experiment with, and discuss, different possible arrangements. For example, when the problem is to design the spacing for two stripes across a rug which is to be woven, if the children cut patterns of the rug and place two splints or pencils across to represent the stripes and

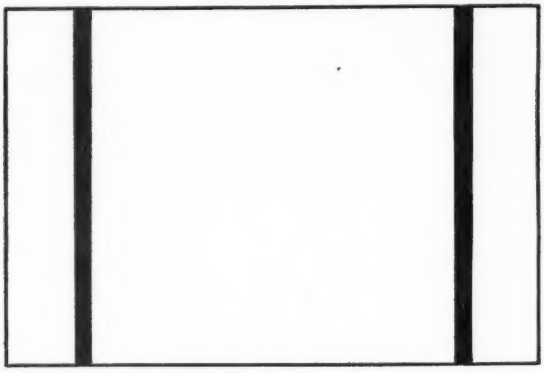

FIG. 6

move these back and forth to see the effect of different spacings, they will generally select as the final choice an arrangement similar to Fig. 6, which is pleasing.

The ability, which is apparent at about this age, to appreciate good spacing, should be developed from year to year till it becomes unerring in its judgment. Thoughtful experimentation is the most effective method of developing this ability.

In the fourth year and during each succeeding year children should have general practice in the use of water color in connection with nature and object drawing. Special emphasis may be placed upon the study of color hues or the steps by which one color merges into another. If samples of two colors adjacent in the spectrum, for example, green and yellow, are placed at

a little distance apart the children can collect and arrange samples so as to form well-graded steps from green to yellow. Later they may represent these steps with water color. The children should also learn to make even, flat washes of color over given areas.

A reasonable standard of accomplishment has been reached at the end of the fifth year in school if to the increased facility in graphic expression which comes from continued general practice has been added definite training in quick perception of relative proportions of shapes and slants of lines, so that the mind is able to retain and compare the image of the object with that of the representation and discern their correspondences and differences. This is likewise true if children can bring to their constructive expression such acquaintance with new tools as gives them new mastery of material, and such knowledge of patterns as enables them to think out processes and forecast results more intelligently, and such constructive interests as lead them to find satisfaction in originating projects and carrying them to a worthy completion. And it is true, too, if they find increased pleasure in well-related spaces, in the best solution of simple problems in design, and in the greater familiarity with color that comes from continued study aided by the addition of a new medium of expression in the form of water colors.

# EDITORIAL NOTES

**The Demand for Economy**

The modern school programme is very much overcrowded. Some of the causes for this condition have been pointed out so often that they are fully recognized. We live in an age which can boast of more forms of knowledge than could any other age. Each new form of knowledge asks for admission to the course of study. In the second place, there is an increasing demand for activity outside of the school. Social life, the demands for training in music or art, or some other refinement are much more exacting than they were a generation ago. In the larger communities vacations tend to grow longer, the school day is condensed into a half-day session, and the hours of study are thus steadily contracted. In the third place, it is being urged on every hand in explicit terms and in a thousand silent acts that children qualify earlier for the productive occupations of life. Boys leave school to go to work. Parents are impatient of the slow progress of their children toward the goal of independence. For these and many other reasons our school programmes are crowded.

**We Cannot Return to the Older Condition**

There is one type of recommendation which is coming to be heard more and more in these latter days. It is recommended that we return to the good old course of study. That was simple and economical and should be restored. Anyone who will examine that older course of study in detail will be convinced that it was not economical. It contained a great deal which was very trivial. There was much needless repetition and much padding in order to fill out the year. Thus the reading books were full of the most impossible stories, unjustified either by their appeal to children's interests or by their value for the training of the mind. The examples in arithmetic were piled mountain high in order to give enough work to fill out the long courses in

arithmetic. The advanced geographies were made larger chiefly by increasing the size of the maps and adding more names of localities. To return to these meager courses in the world of today would be like turning back from our trolleys and steam engines to horse cars and canal boats. The course of study must be enriched in order to comport with modern life.

**Nor Can the Older Forms of Knowledge Be Omitted**

If the new subjects have a right to recognition, the older subjects certainly have an equal right. To drop out or evade arithmetic for nature-study is just as irrational as to hold that there is no room for nature-study. The experiment of getting on without arithmetic and spelling and writing has been faithfully tried in many schools and it can safely be said that no school can dispense with these subjects. They are essential. The method of economizing by omitting them may have seemed simple and direct but it was not a true solution of the problem.

**Difficulty Growing Out of Departmental Teaching**

What we need is a reworking of each part of the course with reference to the whole, a series of detailed economies rather than some general adoption of either the new or the old. One of the greatest obstacles in the way of this reworking of the course is the fact that very few of our educators can take a broad view of the whole field. Our tendency is toward specialization, toward departmental teaching. The only expedient known to the specialist is to put out that which does not belong within his own subject. His own subject, on the other hand, he enthusiastically expands.

**Combination Courses**

There is hope, however, in the fact that in all departments compound courses are being worked out. Thus the students of science are beginning to plan combination courses containing much that is essential and little that is trivial. The students of geography and industry are unifying their interests. The work of history and English is being combined. Thus through combination is economy being effected.

These combination courses realize in a new and most productive form what Herbart advocated in his doctrine of correlation. Many early interpreters of the doctrine looked for

external connections whereby one subject might be attached to another. This external linking did not work out the internal economy which was needed in order to renovate each subject. When, however, there is organized into a single compact course all the various materials which can be unified into a single type of study, then all of the contributing sciences and subjects are genuinely worked over and true economy is attained. Our elementary school needs more combination courses. Combination of arithmetic, geometry, and algebra should be worked out; combinations of physics, geography, and anthropology; combinations of all with English in its broadest sense. These combinations must be worked out in detail, not omitting the essential of any of the subjects nor destroying the opportunities for drill in each. Thus shall we bring about at once condensation and expansion, economy and enlargement of the school programme.

**Revive the Principle of Correlation**

There will be a tendency on the part of all who are primarily interested in single subjects to object to this fusing of lines of thought which have been laboriously differentiated through the growth of science and modern scholarship. There is, however, full justification for this course in history, for in its early history the race learned to know the world in large, undifferentiated terms. So must the child. The specialist has undoubtedly mastered the world in greater detail than did his ancestors, but the breadth of his view is less.

For economy and breadth, for large preparation for future specialization, combination courses are the hope of our common schools.

# BOOK REVIEWS

*How to Study and Teaching How to Study.* By F. M. McMURRAY. New York: Houghton Mifflin Co., 1909. Pp. 324. $1.25.

Dr. McMurray might well claim to be the chief exponent of the movement which has become prominent in the last five years toward more general attention to the problems involved in training children to study. Books on methods of teaching have emphasized the selection and arrangement of subject-matter, the conduct of the recitation and classroom management, but little attention has been devoted to the technique of directing children how to study. Dr. McMurray has been gradually developing his subject for several years in his classes at Teachers College.

The principal topics considered are eight "factors in study" to each of which a chapter is devoted. The first factor in effective study is stated as "the provision for specific purposes." The treatment is a combination of the Herbartian requirement of definitely formulated aims and the Dewey emphasis on the pupils' conscious needs.

"The supplementing of thought" is the second factor treated. The technique of a "discussion recitation" is described. The third factor, the "organization of ideas," involves training children to group the material studied under main points, and sub-points, to make briefs, to neglect non-essentials, to cultivate thoroughness in study. The other factors in study which are treated are: (4) judging of the soundness and worth of statements; (5) memorizing (by association, reflection, and organization); (6) the using of ideas; (7) provision for a tentative rather than a fixed attitude toward knowledge; and (8) provision for individuality (cultivation of initiative). Each chapter has three divisions: (*a*) the necessity and nature of the process; (*b*) the ability of children to carry on the process; and (*c*) practical suggestions for training children.

The style is non-technical, at times rather "gossipy," but always comprehensible, and adapted to the ordinary teacher. This is worth noting as so many recent books for teachers are so technical as to be incomprehensible. There is a wealth of concrete illustrations.

The rather strict Herbartian organization which prevailed in the earlier McMurray method books, and to which exception is often taken, is not so much in evidence. It is evident, however, that factors 1, 2, 3, and 6 are statements of the formal steps.

The following criticisms are suggested: (1) The book is more a discussion of "general method" and less a specific treatment of "how to study" than is desirable. (2) Some parts seem labored and comparatively pointless, e.g., the first part of chap. viii. (3) Apart from the use of the results of the investigations of Earhart, Stone, and Corman, the book does not give evidence of much acquaintance with the results of recent "experimental education."

Thus the chapter on memorizing is largely a summary of the chapter in James's *Principles of Psychology,* and there is no mention of the work of Ebbinghaus and Meumann.

S. C. PARKER

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*Habit-Formation and the Science of Teaching.* By STUART H. ROWE. New York: Longmans, Green & Co. Pp. xvii+308.

This book was written for the purpose of calling attention to the fact that education has to do with many forms of development which cannot be defined in terms of ideas or knowledge. Ideas, the author holds, represent the relatively temporary and unassimilated phases of experience, while habit, which is the term set over against the term idea, refers to the organized, automatized aspects of experience. It has been one of the cardinal mistakes of educational practice to emphasize information and general ideas and other forms of explicit cognition. What is needed in the science of education is a study of those forms of development which do not come to clear explicit cognition but depend upon organizatons which are not recognized.

There is much emphasis in the book on a certain type of drill, not the drill which merely reiterates information until it is learned, but the type of drill which gives the child enough contact with his environment to master it and organize his reactions into settled attitudes. This special form of drill requires methods which the teacher should master. How to initiate a reaction and direct it, how to guide the child from his native instincts as the starting-points to better adjustment to the environment as the end, these are the problems of method. Method is not merely the arrangement of information, not primarily the presentation of ideas.

The reader of this book is impressed with the difficulty of defining habit. Habits of thought are referred to frequently, and habits of interpretation are also noted as desirable. Habits are now like reflexes, now like fixed modes of thought. Habit is in all these uses too inclusive a term. It covers all of the fixed modes of mental organization and certainly ought not to be contrasted with the term idea.

In the second place, one wonders whether there has been such an unqualified mistake made in the assumption of the school that its business is the development of ideas. Our author like many recent writers has found in instincts a model for school work. But human culture is what it is because we have developed out of the instinct stage of evolution into the idea stage. That there is something more significent than idea is a thesis which calls for long defense.

This book will serve to call attention to the current emphasis on habit-psychology and will, at least by its criticisms, call out the defenders of the doctrine that mental life is enriched chiefly by new ideas.

CHARLES H. JUDD

# CURRENT EDUCATIONAL LITERATURE IN THE PERIODICALS[1]

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Librarian, School of Education, The University of Chicago

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[1] Abbreviations.—Cent., Century Magazine; Educa., Education; Educa. R., Educational Review; Educa. T., Educational Times; El. School T., Elementary School Teacher; Good Housekeep., Good Housekeeping; Harp. W., Harper's Weekly; Ind. Educa., Indian Education; Journ. of Educa. (Bost.), Journal of Education (New England); Journ. of Educa. (Lond.), Journal of Education (London); Journ. of Geog., Journal of Geography; Lit. D., Literary Digest; Liv. Age, Living Age; Man. Train. Mag., Manual Training Magazine; New Eng. Mag., New England Magazine; Out., Outlook; Pop. Sci. Mo., Popular Science Monthly; School R., School Review; School W., School World; Sci. Amer., Scientific American; Scot. Geog. Mag., Scottish Geographical Magazine; Tech. World Mag., Technical World Magazine.

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